

Summary of LIGO SEC Impact on Graduate Students

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LIGO has been enormously beneficial to my career. This experience at LIGO, being able to do world-class research and work with the SEC -it's an experience that isn't available anywhere else. – Former Graduate Student

Inverness Research spoke with 6 former graduate students who had some kind of affiliation with LIGO SEC during their graduate school experience. We asked these individuals to share their perceptions of the influence of LIGO on their graduate work, their post-graduate career plans, and in general the ways and extent their relationship with LIGO has impacted their personal and professional lives.

Overwhelmingly, the former students we talked with were profoundly influenced by their connection with the LIGO SEC, particularly with respect to their graduate research work and perspectives on teaching and/or communicating science.

In terms of the **influence on their graduate work**, several students noted that working with LIGO provided a focus for their studies, or increased their interest in doing more work with learning in museums. The following quotes illustrate the ways in which their work with LIGO impacted their graduate studies:

My work was with families and educators and kids and my project looked at family interactions in the science museums. Working with LIGO increased my interest in doing more family work. I enjoyed the research process so much. If you had asked me prior to LIGO if I would have wanted to do research I would have said no, but after LIGO I want to go back to it.

[Working with LIGO SEC] changed my dissertation focus. Taking an inquiry course changed my focus to student attitudes in science courses.

One student mentioned a visit to the Exploratorium as particularly influential:

When I was pursuing my PhD I got to go to the Exploratorium in San Francisco and see how to develop a better teacher model and my research helped me realize that different learning styles can impact education. You can see the effect you can have on students if you reach their learning styles. I got to see how important teaching actually is.

Another student reported that her study would not have been possible without the support and involvement of the LIGO SEC and its staff.

My dissertation was a bigger project with families and we did an experiment. The dissertation study involved an experiment where half of the families did an

inquiry first and then half did the inquiry later. Kathy taught me how to do the inquiry activities with the families, and it was the main component of my dissertation study. They also helped me recruit participants, and provided a nice sample for my study. At the beginning of all of this they sent me to the Exploratorium and the Institute for Inquiry there, and it was the basis for my dissertation.

This former student also noted that her experience at LIGO, coupled with the Institute for Inquiry at the Exploratorium, led to a deeper understanding of “what it means to do research.”

Working with the LIGO SEC also **influenced their thinking about quality science teaching**, and in particular the role of inquiry in science teaching and learning.

I worked as an engineer before and I came to school looking for straight science like at the observatory, but they didn't have anything and in education they had the LIGO SEC and I thought that might be a good thing to get into inquiry. Showing students how to take the abstract and make it practical. Students usually don't get to touch things but here they get to do that, and we need to put more of that back into schools. If I have students build things before giving them equation they will understand better. I checked around and I saw that there was opportunity to get into the inquiry part of science education and I think it's very important and significant to all parts of education.

I was introduced to a new way of presenting science and ways to introduce science and learning about the research that I was doing, as well as what others were doing. I learned about inquiry learning and the importance of hands-on activities and ensuring that students are introduced to science in a positive way that will make them want to go into a STEM career. LIGO helped me present science in an interesting way. I make sure my students can visualize what I'm talking about and I do more hands-on activities. I try to have students touch and feel what I'm talking about.

One former graduate, who now works as a teacher educator, described how working with LIGO helped her understand and experience science in new ways, which has **influenced her work with teachers**:

[LIGO] has taught me to view science differently. When I'm teaching science, I can create mini-labs with my teachers. It's given me a way to teach my future teachers in a more meaningful way. I've shown them how to use household products so they can do hands on science with their students and it all came from LIGO.

One person in particular described the ways being involved with the LIGO SEC has improved her **science communication** skills:

My entire career is based off of working with LIGO. As far as education, I've learned how to communicate about science with the public. I've started a blog about LIGO science. I've worked with teachers of all stages including in-service teacher development. I've gotten involved with LSU and I teach for them and that is an experience that I was afforded because of LIGO.

This individual also noted that opportunities have come her way as a result of her work with LIGO:

I've learned more about exactly what it is that I do by explaining it to others. I've learned new ways of saying things. Whenever you say it in a new way you teach yourself a little bit, and that's been a broad experience that I've had. One of the reasons I teach at LSU is because they discovered me through the SEC. That has been invaluable. If I have to look for an academic position it will make me an excellent candidate for my future. I'm getting an experience with LIGO that no one else has had within the program.

The former students noted other benefits to their participation in LIGO, including new professional connections, increased confidence, and inspiration to “pay it forward,” as these comments illustrate:

LIGO gave me a lot of networking opportunities, and through them I was asked to interview for a position. I saw the behind the scenes. You meet fascinating people and form relationships. I was able to infuse my summer camp with LIGO techniques and take them to LIGO. I have a good relationship with the people at LIGO and I use what I learned there in my curriculum in the courses I now teach.

Personally they were so open to helping and supporting me through my undergrad, masters and dissertation that I want to be able to reach out to others and do the same for them. Academically it allowed me to write and defend a successful dissertation that my committee loved. And research wise my association with LIGO taught me everything I know. I feel confident doing research in museums and my confidence has crossed over to other areas.

We asked the interviewees to offer any suggestions for improving LIGO SEC. Overall, they felt that the most important thing is to provide more access to more people. One way to do that could be to take LIGO to classrooms to provide greater access to students. Another, and on a different level, could be to offer more support for graduate students to design studies of learning at the SEC.